

## THE OPERATION MECHANISM OF POROUS GAS ELECTRODE

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In order to study the operation mechanism of porous gas diffusion electrodes the pore radii distribution and the surface area of nickel electrodes having different structures were determined.

On the basis of data on the electrode structure and of measurements of the rate of the electrochemical reaction at various gas/electrolyte pressure differences, a model for the operation of a porous gas electrode has been proposed.

The electrochemical reaction is assumed to occur at the surface of macropores from which the electrolyte has been expelled by the gas near the orifice of micropores filled with electrolyte, the latter ensuring the transport of current. It is further assumed that the sites at which the current is generated are uniformly distributed over the whole electrode surface.

According to this model the electrochemical activity of a porous gas electrode depends on the ratio of the surface area of pores free from electrolyte to the total cross section of pores filled with electrolyte.

The maximum electrochemical activity corresponds to definite relations between the experimentally determined structural parameters. A theoretical treatment of several porous electrode models has been carried out, the results obtained being in good agreement with the experimental data.

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